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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/602,637

06/25/2003

Takaaki Kutsuna

396.42795X00

1073

20457 7590 04/01/2008  
ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-3873

EXAMINER

PATTERSON, MARC A

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

04/01/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/602,637	<b>Applicant(s)</b> KUTSUNA ET AL.	
	<b>Examiner</b> MARC A. PATTERSON	<b>Art Unit</b> 1794	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,6 and 8-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6 and 8-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections – 35 USC § 103(a)*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 - 2, 6 and 8 - 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerdes et al (U.S. Patent No. 4,719,135) in view of Tashiro et al (U.S. Patent No. 3,704,229) and Huang et al (U.S. Patent No. 3,683,044).

With regard to Claims 1 - 2, 6, 8, 10 - 14, 17 - 18, 20 and 22, Gerdes et al discloses a fuel system comprising a fuel vessel (fuel tank; column 1, lines 8 - 11) which is molded and therefore has molded parts (column 2, lines 41 - 45) constituted from a thermoplastic resin (high density polyethylene; column 2, lines 43 - 45) and a coating layer formed on the surface of the outside of the vessel body (coating of varnish, therefore on the molded parts; column 1, lines 51 - 55) formed by curing an epoxy resin composition comprising an epoxy resin and an epoxy resin curing agent (column 2, lines 50 - 55), the coating layer having a gasoline permeability coefficient of 2g mm/m day or less at 60 degrees Celsius and a relative humidity of 60% RH (fuel impermeability, therefore no permeability; column 3, lines 36 - 37). Gerdes et al fail to disclose an epoxy curing agent comprising a reaction product of metaxylylenediamine and an acrylic acid derivative which can form an amide by reacting with polyamine to form an oligomer and an epoxy resin having a glycidylamine part derived from metaxylylenediamine.

Tashiro et al teach a curing agent for epoxy which comprises a reaction product (column 1, lines 59 - 52) of metaxylylenediamine (column 2, line 14) and acrylic acid derivative (acrylic acid ester; column 1, line 63), which is used for the purpose of obtaining an epoxy that is curable in a wet state (column 1, lines 28 - 31). One of ordinary skill in the art would therefore have recognized the advantage of providing for the curing agent of Tashiro et al in Gerdes et al, which comprises an epoxy, depending on the desired properties of the end product.

Huang et al teach an epoxy resin having a glycidylamine part derived from metaxylylenediamine (column 2, lines 1 - 6) for the purpose of obtaining cured products having excellent heat resistance (column 5, lines 57 - 59). One of ordinary skill in the art would therefore have recognized the advantage of providing for the epoxy resin of Huang et al in Gerdes et al, which comprises an epoxy resin, depending on the desired heat resistance of the end product.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a cured epoxy comprising a reaction product of metaxylylenediamine and acrylic acid derivative in Gerdes et al in order to obtain an epoxy that is curable in a wet state as taught by Tashiro et al and to have provided for an epoxy resin having a glycidylamine part derived from metaxylylenediamine in order obtain a cured product having excellent heat resistance as taught by Huang et al. The claimed aspect of the acrylic acid derivative being a derivative that can form an amide by reacting with polyamine to form an oligomer is given little patentable weight as it is directed to a process limitation rather than a structural limitation.

The blending proportion of the epoxy resin to the epoxy resin curing agent falls in a range of 1.2 to 3.0 in terms of the ratio of active hydrogen to epoxy group (curing agent is utilized in stoichiometric excess of 1.5 molar excess; column 3, lines 65 - 68; column 4, lines 1 - 2); the claimed formula (1) would therefore be contained in the amount of 30% by weight.

With regard to Claim 9, because Gerdes et al disclose a fuel vessel which is coated, Gerdes et al disclose coating of an area rate of 100%.

With regard to Claims 15 - 16, the container disclosed by Gerdes et al is a tube (canister, therefore cylindrical, therefore having a tube body; column 1, lines 8 - 10).

With regard to Claim 19, Tashiro et al teach an acrylic acid derivative, as stated above; the mole ratio is therefore 0.3 to 0.97 in terms of amino groups to reactive function groups in the epoxy.

With regard to Claim 21, the thickness of the coating layer disclosed by Gerdes et al is in a range of 1 to 200  $\mu$ m (column 4, line 55).

3. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gerdes et al (U.S. Patent No. 4,719,135) in view of Tashiro et al (U.S. Patent No. 3,704,229) and Watanabe et al (U.S. Patent No. 5,474,853).

Gerdes et al discloses a fuel system as discussed above. Gerdes et al fail to disclose an epoxy curing agent comprising a reaction product of metaxylylenediamine and an acrylic acid derivative which can form an amide by reacting with polyamine to form an oligomer and an epoxy resin having a glycidylamine part derived from metaxylylenediamine.

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Tashiro et al teach a curing agent for epoxy which comprises a reaction product (column 1, lines 59 - 52) of metaxylylenediamine (column 2, line 14) and acrylic acid derivative (acrylic acid ester; column 1, line 63), which is used for the purpose of obtaining an epoxy that is curable in a wet state (column 1, lines 28 - 31). One of ordinary skill in the art would therefore have recognized the advantage of providing for the curing agent of Tashiro et al in Gerdes et al, which comprises an epoxy, depending on the desired properties of the end product.

Watanabe et al teach an epoxy resin having a glycidylamine part derived from bis(aminomethyl) - cyclohexane (column 7, lines 38 - 41) for the purpose of obtaining cured products having improved rigidity (column 7, line 5). One of ordinary skill in the art would therefore have recognized the advantage of providing for the epoxy resin of Watanabe et al in Gerdes et al, which comprises an epoxy resin, depending on the desired rigidity of the end product.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a cured epoxy comprising a reaction product of metaxylylenediamine and acrylic acid derivative in Gerdes et al in order to obtain an epoxy that is curable in a wet state as taught by Tashiro et al and to have provided for an epoxy resin having a glycidylamine part derived from bis(aminomethyl) - cyclohexane in order obtain a cured product having improved rigidity as taught by Watanabe et al. The claimed aspect of the acrylic acid derivative being a derivative that can form an amide by reacting with polyamine to form an oligomer is given little patentable weight as it is directed to a process limitation rather than a structural limitation.

The blending proportion of the epoxy resin to the epoxy resin curing agent falls in a range of 1.2 to 3.0 in terms of the ratio of active hydrogen to epoxy group (curing agent is utilized in stoichiometric excess of 1.5 molar excess; column 3, lines 65 - 68; column 4, lines 1 - 2); the claimed formula (1) would therefore be contained in the amount of 30% by weight.

#### ANSWERS TO APPLICANT'S ARGUMENTS

4. Applicant's arguments regarding the 35 U.S.C. 103(a) rejection of Claims 1 - 2, 6 and 8 – 22 as being unpatentable over Gerdes et al (U.S. Patent No. 4,719,135) in view of Tashiro et al (U.S. Patent No. 3,704,229) and Huang et al (U.S. Patent No. 3,683,044), of record in the previous Action, have been carefully considered but have not been found to be persuasive for the reasons set forth below.

Applicant argues, on page 6 of the remarks dated March 10, 2007, that Gerdes et al requires an amine - based curing agent, rather than the claimed curing agent.

However, as stated on page 12 of the previous Action, the claimed curing agent is taught by Tashiro et al; furthermore, Tashiro et al teaches that the curing agent is an amine based curing agent, because the curing agent has an amine number (column 3, line 52).

Applicant also argues on page 12 that Gerdes et al does not disclose the claimed skeletal structure.

However, as stated on page 2 of the previous Action, the combination of Gerdes et al, Tashiro et al and Huang et al discloses the skeletal structure, as the claimed epoxy and curing agent are disclosed.

Applicant also argues, on page 13, that Gerdes et al do not disclose xylylenediamine.

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However, as stated above, xylylenediamine is taught by Tashiro et al.

Applicant also argues on page 13 that Gerdes et al do not disclosed glycidylamine.

However, as stated above, glycidylamine is taught by Huang et al.

Applicant also argues on page 16 that the amount of the claimed structure is not disclosed by Gerdes.

However, as stated above, the claimed structure would have been obvious in view of Gerdes et al, Tashiro et al and Huang et al.

Applicant also argues, on page 18, that Tashiro et al and Huang et al are silent as to fuel barrier properties.

However, as stated on page 2 of the previous Action, Gerdes et al disclose fuel barrier properties, and it would have been obvious for one of ordinary skill in the art to have provided for the epoxy and curing agent of Tashiro et al and Huang et al in Gerdes et al.

Applicant also argues on page 18, that Tashiro et al fails to disclose the claimed glycidylamine, describing glycidyl ethers derived from bisphenol A, for example.

However, as neither glycidyl ether, or bisphenol A, is claimed, it is unclear how glycidyl ether or bisphenol A defines the claimed invention.

Applicant also argues, on page 21, that Huang et al is silent as to fuel barrier properties.

However, as stated on page 2 of the previous Action, Gerdes et al disclose fuel barrier properties, and it would have been obvious for one of ordinary skill in the art to have provided for the epoxy and curing agent of Tashiro et al and Huang et al in Gerdes et al.



Applicant also argues, on page 22, that the claimed aspect of being able to form an amide by reacting with polyamine to form an oligomer is directed to a property that must be given patentable weight.

However, the property is given patentable weight, as the structure is disclosed by Gerdes et al, Tashiro et al and Huang et al.

Applicant also argues on page 22 that the claimed glycidylamine part is not taught by Tashiro et al.

However, as stated above, a glycidylamine derived from metaxylylenediamine is taught by Tashiro et al.

Applicant also argues, on page 23, that no reason as been provided for the curing of Huang et al by Tashiro et al.

However, as stated above, it would have been obvious for one of ordinary skill in the art to have provided for the epoxy of Huang et al in Gerdes et al and the curing agent of Tashiro et al in Gerdes et al.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc A Patterson whose telephone number is 571-272-1497. The examiner can normally be reached on Mon - Fri 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marc A Patterson/

Primary Examiner, Art Unit 1794